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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/555,067	10/28/2005	Yoshiaki Takahashi	Q75504	9174

23373 7590 09/18/2008

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EXAMINER	
WILSON, MICHAEL H	

ART UNIT	PAPER NUMBER
1794	

MAIL DATE	DELIVERY MODE
09/18/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/555,067	TAKAHASHI ET AL.	
	Examiner	Art Unit	
	MICHAEL WILSON	1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 July 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7,11,12,14,17-20 and 22-25* is/are pending in the application.

4a) Of the above claim(s) *8-10,13,15,16 and 21* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7,11,12,17-20 and 22-25* is/are rejected.

7)☒ Claim(s) *14* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 October 2005* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *20051028; 20070601*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of species 3 (a gold complex with an alkynyl ligand and a phosphine (PR_3) ligand) in the reply filed on 9 July, 2008 is acknowledged.

2. Claims 8-10, 13, 15, 16, and 21 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 9 July, 2008.

3. The elected species as described above is used as the starting point for search and examination. Although this Office action addresses some non-elected species, this action should not be taken as an examination on the merits of every possible compound within the scope of the present claims. It was not necessary to extend the search to all species in order to determine the patentability of the present claims.

Drawings

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: the reference numbers (1-6) in figure 1 are not mentioned in the description.

Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being

amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

5. Claim 14 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in the alternative only. See MPEP § 608.01(n). Additionally it is noted that claim 14 refers to "the organic phosphine compound in claim 7," however claim 7 is drawn to a organic polymer light-emitting element material. Accordingly, the claim has not been further treated on the merits.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-6, 19, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Ikehira et al. (US 2002/0193532 A1).

Regarding claims 1 and 2, Ikehira et al. disclose an organic polymer light-emitting element material having a gold complex (page 5, [0017] last structure) as part of the side chain [0037], with a polystyrene reduced number-average molecular weight of 10^3 to 10^8.

Regarding claims 3-6, Ikehira et al. disclose all the claim limitations as set forth above. Additionally the reference discloses wherein the gold complex contains an organic phosphine ligand. The gold complex would necessarily be bonded to the polymer backbone via one of the phosphine ligands.

Regarding the method limitations recited in claim(s) 3, 5, and 6, the examiner notes that even though a product-by-process is defined by the process steps by which the product is made, determination of patentability is based on the product itself. *In re Thorpe*, 777 F.2d 695, 227 USPQ 964 (Fed. Cir. 1985). As the court stated *in Thorpe*, 777 F.2d at 697, 227 USPQ at 966 (The patentability of a product does not depend on its method of production. *In re Pilkington*, 411 F.2d 1345, 1348, 162 USPQ 145, 147 (CCPA 1969). If the product in a product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.).

Regarding claims 19 and 20, Ikehira et al. disclose all the claim limitations as set forth above. Additionally the reference discloses an organic polymer light-emitting element comprising a pair of electrodes having interposed there between at least one layer comprising one or more organic polymer light-emitting element material ([0175]-[0176]).

8. Claims 1-7, 11, 12, and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Irwin et al. (Luminescent gold(I) acetylides: from model compounds to polymers.).

Regarding claim 1, Irwin et al. disclose an organic polymer light-emitting element material having a gold complex as a cross linking group (abstract and page 3543 chart 1). Since the polymer is the only positive limitation for the material, any reference anticipating the polymer anticipates the material.

Regarding claim 2, Irwin et al. disclose all the claim limitations as set forth above. While the reference does not disclose the molecular weight of the polymer, the dimer has a molecular weight of 698 g/mol (complex 4, table 1, page 3542). Therefore it would be readily apparent to one of ordinary skill in the art that polymers of the gold complex, as disclosed by Irwin et al., would fall within the claimed range.

Regarding claims 3-6, Irwin et al. disclose all the claim limitations as set forth above. Additionally the reference discloses wherein the gold complex contains an organic phosphine ligands (abstract and page 3543 chart 1). The gold polymer is cross linked into the polymer on both the phosphine and acetylide end of the gold complex (chart 1, page 3543).

Regarding the method limitations recited in claim(s) 3, 5, and 6, the examiner notes that even though a product-by-process is defined by the process steps by which the product is made, determination of patentability is based on the product itself. *In re Thorpe*, 777 F.2d 695, 227 USPQ 964 (Fed. Cir. 1985). As the court stated *in Thorpe*,

777 F.2d at 697, 227 USPQ at 966 (The patentability of a product does not depend on its method of production. *In re Pilkington*, 411 F.2d 1345, 1348, 162 USPQ 145, 147 (CCPA 1969). If the product in a product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.).

Regarding claims 7, 11, and 12, Irwin et al. disclose all the claim limitations as set forth above. Additionally the reference discloses wherein the organic polymer light-emitting element material comprises a gold complex with phosphine and acetylide ligands meeting instant formulae (1) and (5) (table 1, page 3543) wherein R12 to R15 are phenyl groups. While the reference does not explicitly call the phenyl group a "polymerizable functional group" the complex is attached to the polymer via phenyl groups, therefore the product-by-process limitation is considered to be met by the polymer of Irwin et al. (table 1, page 3543) because at least one of the R12 to R15 functional groups binds the gold complex with the polymer chain.

Regarding claim 22, Irwin et al. disclose an organic polymer light-emitting element material the gold complex having a gold complex as a cross linking group (abstract and page 3543 chart 1), which meets instant formula (5). The gold polymer is cross linked into the polymer on both the phosphine and acetylide end of the gold complex (table 1, page 3543).

Regarding the method limitations recited in claim 22, the examiner notes that even though a product-by-process is defined by the process steps by which the product is made, determination of patentability is based on the product itself. *In re Thorpe*, 777

F.2d 695, 227 USPQ 964 (Fed. Cir. 1985). As the court stated *in Thorpe*, 777 F.2d at 697, 227 USPQ at 966 (The patentability of a product does not depend on its method of production. *In re Pilkington*, 411 F.2d 1345, 1348, 162 USPQ 145, 147 (CCPA 1969). If the product in a product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.). Additionally, since the polymer is the only positive limitation for the material, any reference anticipating the polymer anticipates the material.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. Claims 7, 11, 12, 22, 24, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikehira et al. (US 2002/0193532 A1) as applied to claims 1 and 3

above and in view of Irwin et al. (Luminescent gold(I) acetylides: from model compounds to polymers.).

Regarding claims 7, 11, and 12, Ikehira et al. disclose all the claim limitations as set forth above. Additionally the reference discloses wherein the luminescent compound, bound to the polymer backbone, may be a gold complex with diphosphine ligands. However the reference does not explicitly disclose a gold complex with a monophosphine ligand with the structure of instant formula (1).

Irwin et al. teach luminescent gold(I) compounds (abstract). The gold(I) compounds can be monomers, dimers or polymers (abstract). The gold complexes are taught to have a phosphine ligand with a structure of instant formula (1) and an alkynyl ligand (page 3543, chart 1), which would meet instant formula (5). The reference teaches the compounds are luminescent as solids as monomer, dimer, and polymer (pages 3544-3545, Luminescence Properties, paragraphs 1-3), and the monomer complex is taught to exhibit intense emission (page 3544, Luminescence Properties, paragraph 1).

It would be obvious to one of ordinary skill in the art at the time of the invention to combine the gold complex of Irwin et al. with the polymer of Ikehira et al. One of ordinary skill in the art would reasonably expect the gold complex of Irwin to be suitable given that Irwin et al. teach the complex is emissive in the solid state as both a monomer and polymer. One of ordinary skill in the art would be motivated by a desire to have intense red emission.

Regarding claims 22, 24, and 25, Ikehira et al. disclose an organic polymer light-emitting element material having a gold complex (page 5, [0017] last structure) Additionally the reference discloses wherein the gold complex contains an organic phosphine ligand. The gold complex would necessarily be bonded to the polymer backbone via one of the phosphine ligands. The reference also discloses an organic polymer light-emitting element comprising a pair of electrodes having interposed there between at least one layer comprising one or more organic polymer light-emitting element material ([0175]-[0176]). However the reference does not explicitly disclose a gold complex with a structure of instant formula (5).

Irwin et al. teach luminescent gold(I) compounds (abstract). The gold(I) compounds can be monomers, dimers or polymers (abstract). The gold complexes are taught to have a phosphine ligand with a structure of instant formula (1) and an alkynyl ligand (page 3543, chart 1), which would meet instant formula (5). The reference teaches the compounds are luminescent as solids as monomer, dimer, and polymer (pages 3544-3545, Luminescence Properties, paragraphs 1-3), and the monomer complex is taught to exhibit intense emission (page 3544, Luminescence Properties, paragraph 1)

It would be obvious to one of ordinary skill in the art at the time of the invention to combine the gold complex of Irwin et al. with the polymer of Ikehira et al. One of ordinary skill in the art would reasonably expect the gold complex of Irwin to be suitable given that Irwin et al. teach the complex is emissive in the solid state as both a

monomer and polymer. One of ordinary skill in the art would be motivated by a desire to have intense red emission.

Regarding the method limitation recited in claim 22, the examiner notes that even though a product-by-process is defined by the process steps by which the product is made, determination of patentability is based on the product itself. *In re Thorpe*, 777 F.2d 695, 227 USPQ 964 (Fed. Cir. 1985). As the court stated *in Thorpe*, 777 F.2d at 697, 227 USPQ at 966 (The patentability of a product does not depend on its method of production. *In re Pilkington*, 411 F.2d 1345, 1348, 162 USPQ 145, 147 (CCPA 1969). If the product in a product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.).

12. Claims 17 and 18, rejected under 35 U.S.C. 103(a) as being unpatentable over Ikehira et al. (US 2002/0193532 A1) as applied to claim 3 above and in view of Irwin et al. (Luminescent gold(I) acetylides: from model compounds to polymers.) and Senoo et al. (US 2002/0045062 A1).

Regarding claims 17 and 18, Ikehira et al. disclose all the claim limitations as set forth above. Additionally the reference discloses wherein the luminescent compound, bound to the polymer backbone, may be a gold complex with diphosphine ligands. However the reference does not explicitly disclose a gold complex with a structure of instant formula (5) or that a polymerizable alkene is used in the polymerization process.

Irwin et al. teach luminescent gold(I) compounds (abstract). The gold(I) compounds can be monomers, dimers or polymers (abstract). The gold complexes are taught to have a phosphine ligand with a structure of instant formula (1) and an alkynyl ligand (page 3543, chart 1), which would meet instant formula (5). The reference teaches the compounds are luminescent as solids as monomer, dimer, and polymer (pages 3544-3545, Luminescence Properties, paragraphs 1-3), and the monomer complex is taught to exhibit intense emission (page 3544, Luminescence Properties, paragraph 1).

Senoo et al. teach a polymer electroluminescent device (abstract). The reference teaches using alkene functional groups to form the monomers into a polymer [0015]. By using polymerizable double bonds, which have radical polymerizability, the reference teaches high luminance at low voltage with high durability can be attained with easy and inexpensive production [0017].

It would be obvious to one of ordinary skill in the art at the time of the invention to combine the gold complex of Irwin et al. with the polymer of Ikehira et al. One of ordinary skill in the art would reasonably expect the gold complex of Irwin to be suitable given that Irwin et al. teach the complex is emissive in the solid state as both a monomer and polymer. One of ordinary skill in the art would be motivated by a desire to have intense red emission.

It would be obvious to one of ordinary skill in the art at the time of the invention to use the polymerizable alkene groups as taught by Senoo et al. in the polymer and device of modified Ikehira et al. One of ordinary skill in the art would reasonably expect

such a combination to be suitable given that Senoo et al. teach the polymer made from polymerizing double bonds as a suitable polymer for use in electroluminescent devices. One of ordinary skill would be motivated by a desire to have high luminance at low voltage with high durability can be attained with easy and inexpensive production.

13. Claims 17, 18, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Irwin et al. (Luminescent gold(I) acetylides: from model compounds to polymers.) as applied to claims 3 and 22 above and in view of Ikehira et al. (US 2002/0193532 A1) and Senoo et al. (US 2002/0045062 A1).

Regarding claim 17, 18, and 23, Irwin et al. disclose all the claim limitations as set forth above. Additionally the reference discloses wherein the gold complex contains an organic phosphine ligands (abstract and page 3543 chart 1). The gold polymer is cross linked into the polymer on both the phosphine and acetylide end of the gold complex (table 1, page 3543). However the reference does not explicitly disclose that a polymerizable alkene is used in the polymerization process.

Senoo et al. teach a polymer electroluminescent device (abstract). The reference teaches using alkene functional groups to form the monomers into a polymer [0015]. By using polymerizable double bonds, which have radical polymerizability, the reference teaches high luminance at low voltage with high durability can be attained with easy and inexpensive production [0017].

It would be obvious to one of ordinary skill in the art at the time of the invention to use the polymerizable alkene groups as taught by Senoo et al. in the polymer and

device of modified Ikehira et al. One of ordinary skill in the art would reasonably expect such a combination to be suitable given that Senoo et al. teach the polymer made from polymerizing double bonds as a suitable polymer for use in electroluminescent devices. One of ordinary skill would be motivated by a desire to have high luminance at low voltage with high durability can be attained with easy and inexpensive production.

14. Claims 19, 20, 24, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Irwin et al. (Luminescent gold(I) acetylides: from model compounds to polymers.) as applied to claims 1 and 22 above and in view of Ikehira et al. (US 2002/0193532 A1).

Regarding claims 19, 20, 24 and 25, Irwin et al. disclose all the claim limitation as set forth above. Additionally the reference discloses the gold complex having a gold complex as a cross linking group (abstract and page 3543 chart 1), which meets instant formula (5). The gold polymer is cross linked into the polymer on both the phosphine and acetylide end of the gold complex (table 1, page 3543). However, the reference does not explicitly disclose the polymer used in an electroluminescent device.

Ikehira et al. teach a polymer organic electroluminescent element with a pair of electrodes having interposed there between at least one layer comprising one or more organic polymer light-emitting element material ([0175]-[0176]). The reference also teaches that a gold complex is suitable for the emissive compound within the polymer (page 5, [0017] last structure).

It would be obvious to one of ordinary skill in the art at the time of the invention to combine the gold compound of Irwin et al. with the polymer and device of Ikehira et al. One of ordinary skill in the art would reasonably expect the complex of Irwin et al. to be suitable given that Ikehira et al. teach that gold complexes are suitable and that Irwin et al. disclose the gold complexes are luminescent in the solid state in both monomeric and polymeric forms. One of ordinary skill in the art would be motivated by a desire to utilize the light-emission from the complexes of Irwin et al.

15. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ikehira et al. (US 2002/0193532 A1) in view of Irwin et al. (Luminescent gold(I) acetylides: from model compounds to polymers.) as applied to claim 22 above, and further in view of Senoo et al. (US 2002/0045062 A1).

Regarding claim 23, modified Ikehira et al. disclose all the claim limitations as set forth above. However the reference does not explicitly disclose that a polymerizable alkene is used in the polymerization process.

Senoo et al. teach a polymer electroluminescent device (abstract). The reference teaches using alkene functional groups to form the monomers into a polymer [0015]. By using polymerizable double bonds, which have radical polymerizability, the reference teaches high luminance at low voltage with high durability can be attained with easy and inexpensive production [0017].

It would be obvious to one of ordinary skill in the art at the time of the invention to use the polymerizable alkene groups as taught by Senoo et al. in the polymer and

device of modified Ikehira et al. One of ordinary skill in the art would reasonably expect such a combination to be suitable given that Senoo et al. teach the polymer made from polymerizing double bonds as a suitable polymer for use in electroluminescent devices. One of ordinary skill would be motivated by a desire to have high luminance at low voltage with high durability can be attained with easy and inexpensive production.

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lu et al. (The 3($\pi\pi^*$) emission of Cy3Pau(C≡C)nAuPCy3 (n=3, 4). Effect of chain length upon acetylenic 3($\pi\pi^*$) emission.), Eisler et al. (An organometallic octopus complex: structure and properties of a resorcinarene with 16 cobalt centers), Puddephatt (Precious metal polymers: platinum or gold atoms in the backbone), Yam et al. (Synthesis, characterization, structure and luminescence studies of mono-, di-, and trinuclear gold(I) phosphine alkynyl complexes), Payne et al. (easy double structure of a diphosphinomethane ligand: structure of a remarkable octagold cage complex), and Narayanaswamy et al. (Synthesis, structure, and electronic spectroscopy of neutral, dinuclear gold(I)-gold(I) interactions in solution and in the solid state.), each disclose gold complexes but are cumulative to the rejections of record.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL WILSON whose telephone number is (571) 270-3882. The examiner can normally be reached on Monday-Thursday, 7:30-5:00PM EST, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Callie Shosho can be reached on (571) 272-1123. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

18. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MHW

/Callie E. Shosho/
Supervisory Patent Examiner, Art Unit 1794